

(12) UK Patent Application (19) GB (11) 2 305 810 (13) A

(43) Date of A Publication 16.04.1997

(21) Application No 9619367.7

(22) Date of Filing 17.09.1996

(30) Priority Data

(31) 08533977

(32) 26.09.1995

(33) US

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(51) INT CL⁶

H04M 1/02

(52) UK CL (Edition O)

H4J JK J30H J30K J36Q

(56) Documents Cited

GB 2293517 A

JAPIO Abstract Accession No. 01414754 & JP
590126354A

(58) Field of Search

UK CL (Edition O) H3Q QACA QACX , H4J JAAB JK
INT CL⁶ H04B 1/03 1/034 1/08 1/38 , H04M 1/02 1/03
1/60 1/62 1/72

ONLINE: WPI, JAPIO, CLAIMS

(54) Radiotelephone handset having a removably latching faceplate to accommodate a plurality of distinctive appearances

(57) A radiotelephone handset 100 is adapted to accommodate a plurality of distinctive telephone appearances. The handset includes a housing 102 adapted to receive the faceplate 104 as one of a plurality of faceplates, the faceplate 104 having an outer surface (166, fig. 2) with a distinctive user interface appearance and an inner surface 168. The faceplate 104 includes a latch pin 208 extending from the inner surface 168. The housing 102 includes a front face (130, fig. 2) having an aperture (157, fig. 2) adapted to receive the latch pin 208, and further includes a latch keeper 224 configured to releasably engage the latch pin 208, such that in the release configuration the faceplate 104 may be readily removed and replaced (fig. 5), and in the lock configuration the faceplate is secured to the housing 102 (fig. 4), even if the handset 100 is dropped or jarred, thus providing an advantage over prior snap-fit faceplates.

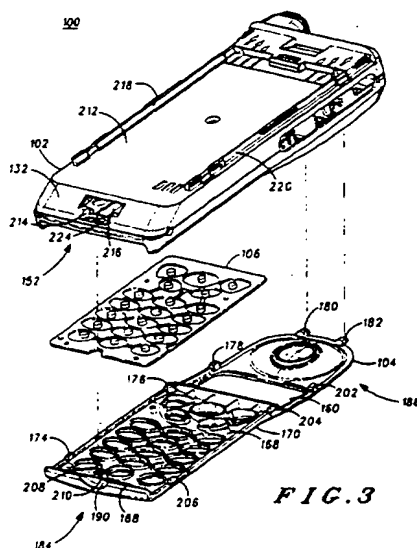


FIG. 3

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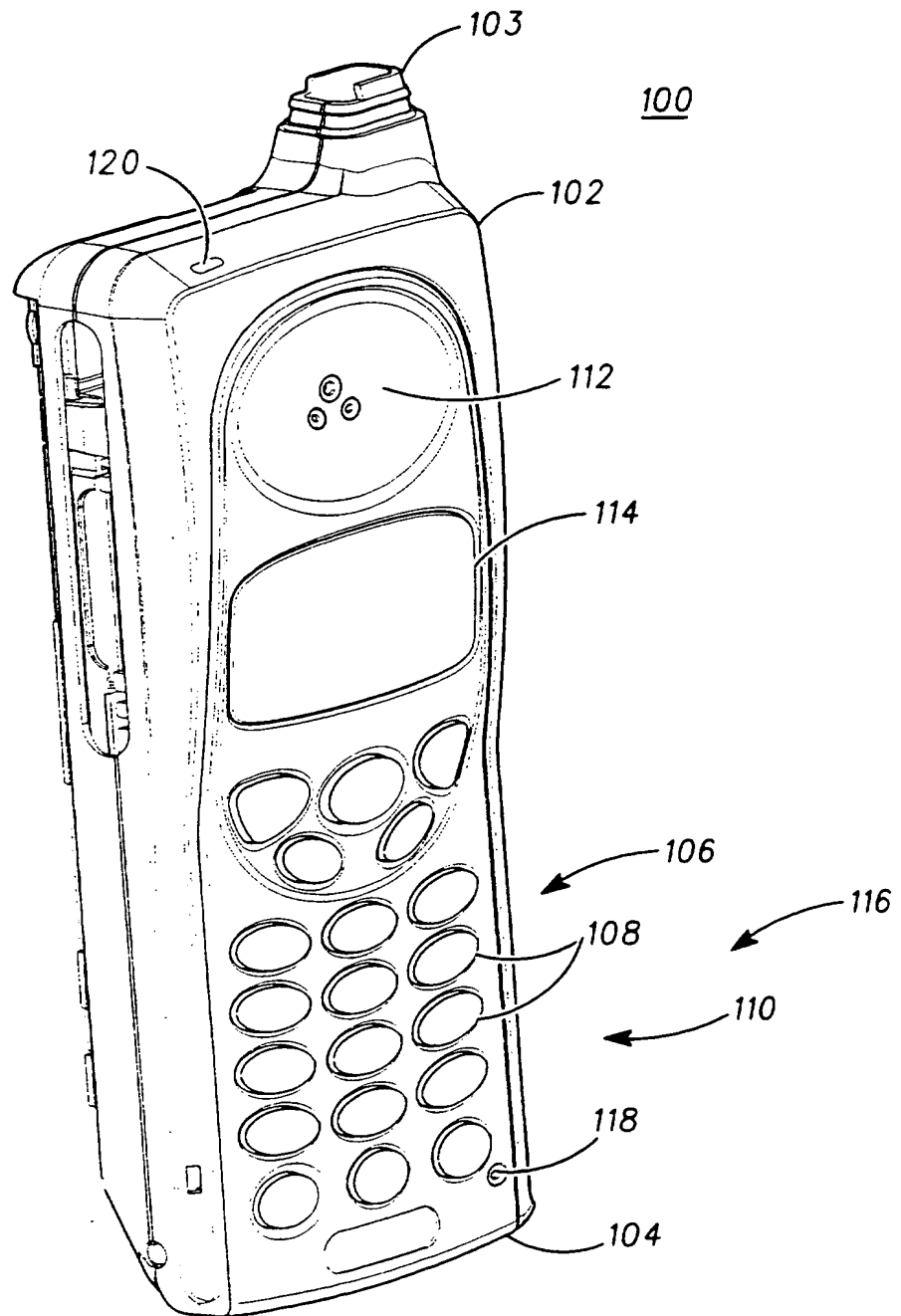
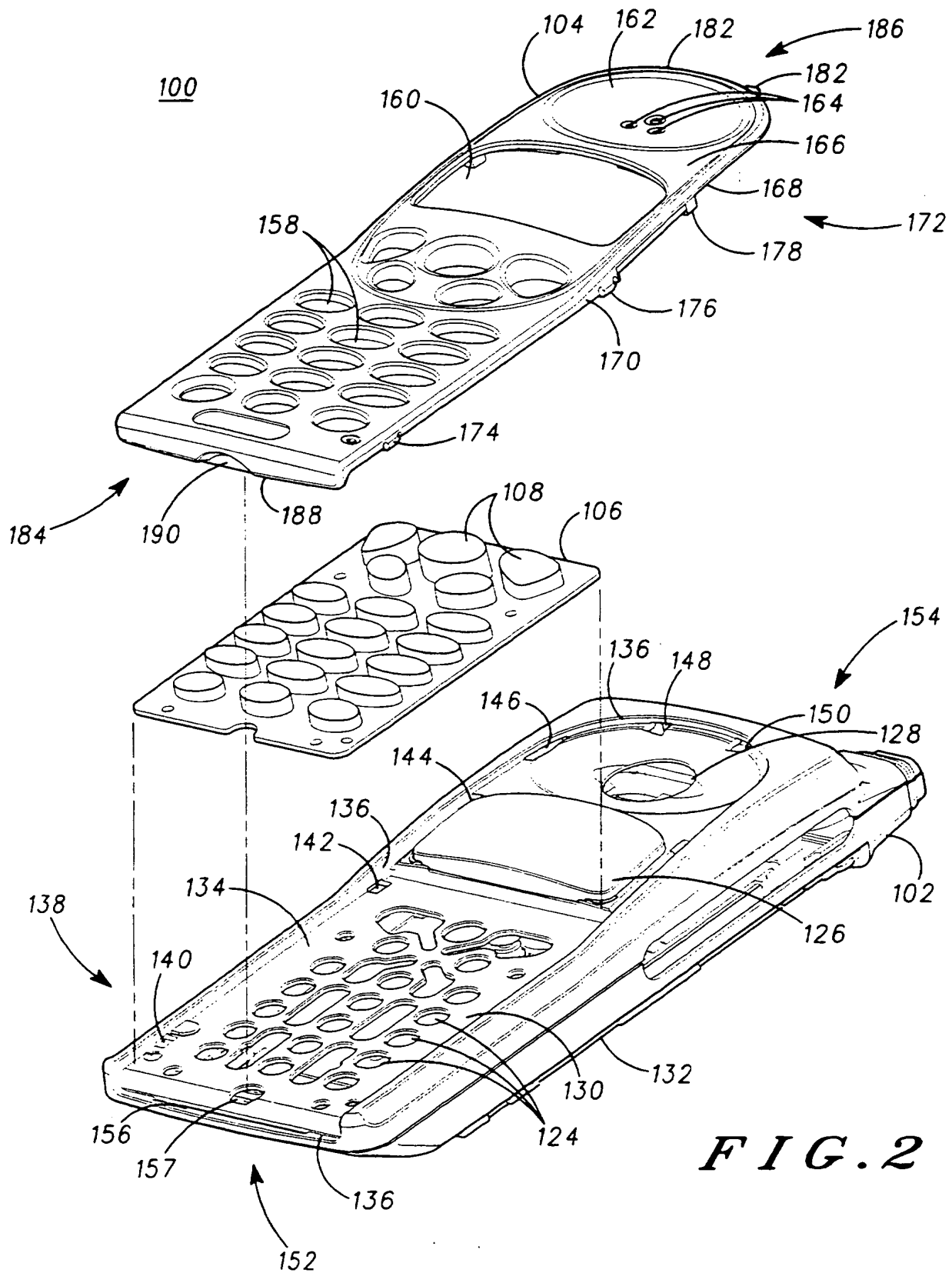
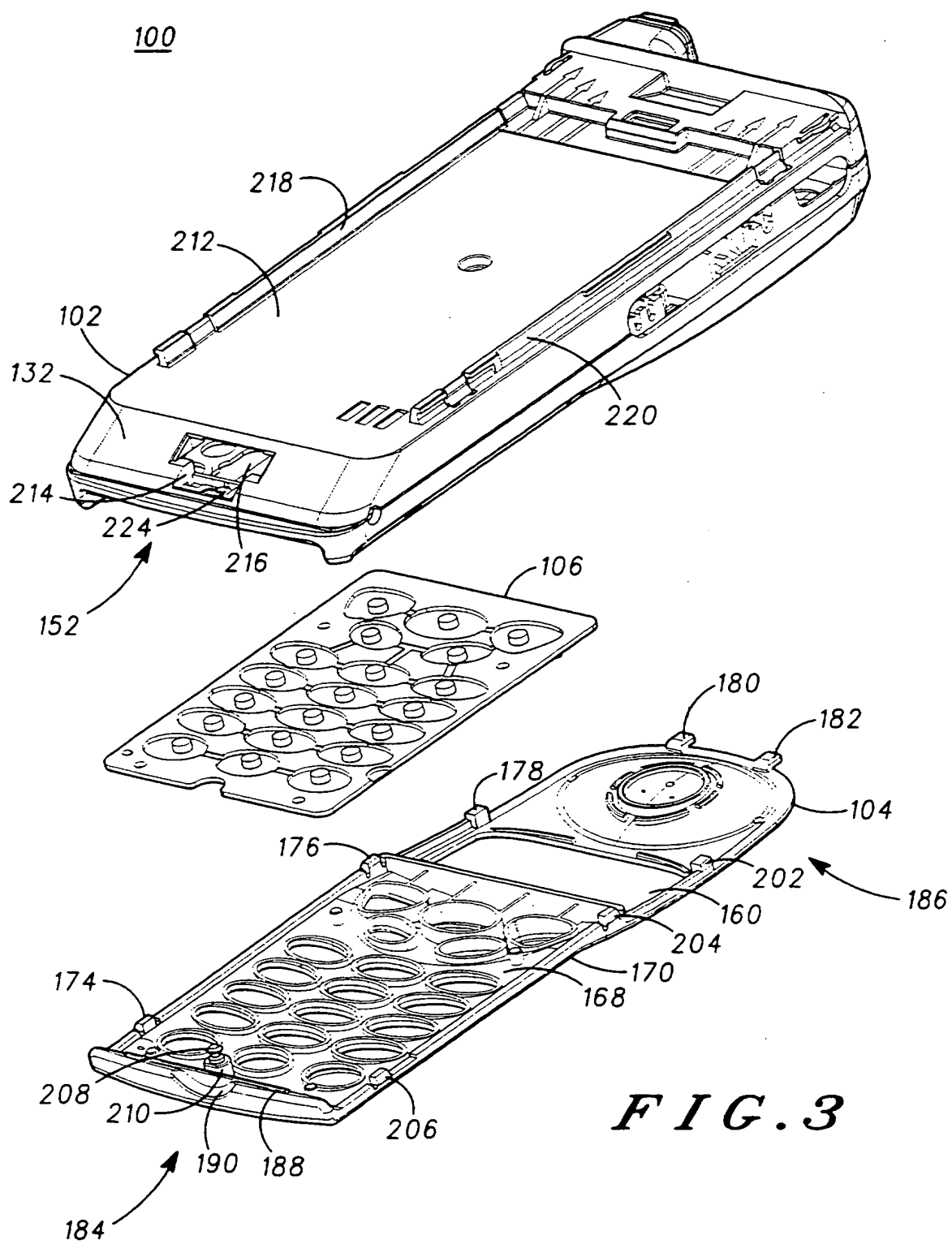
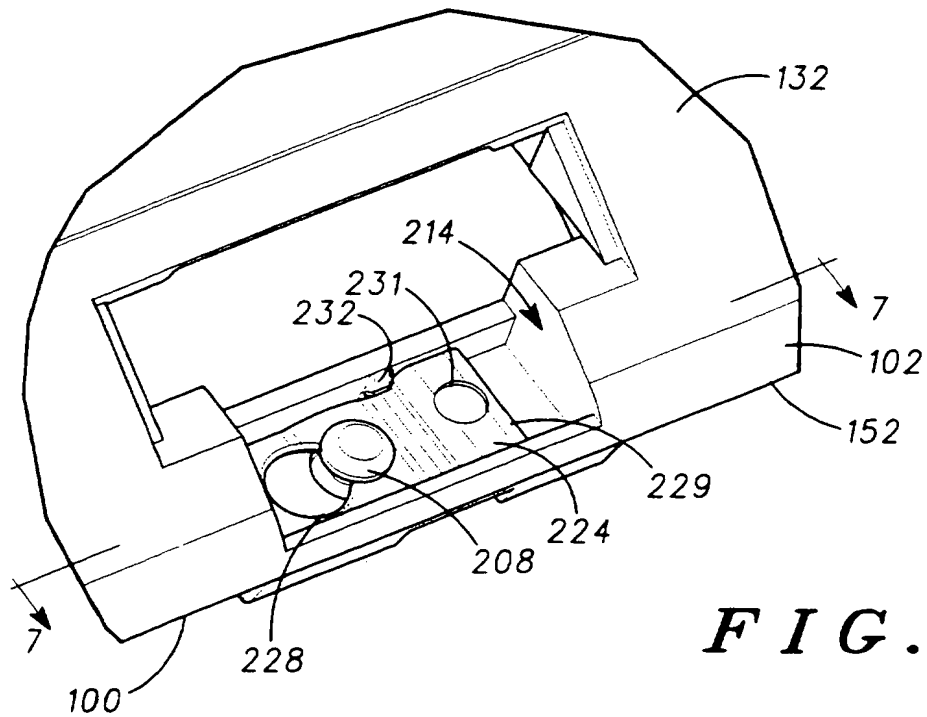
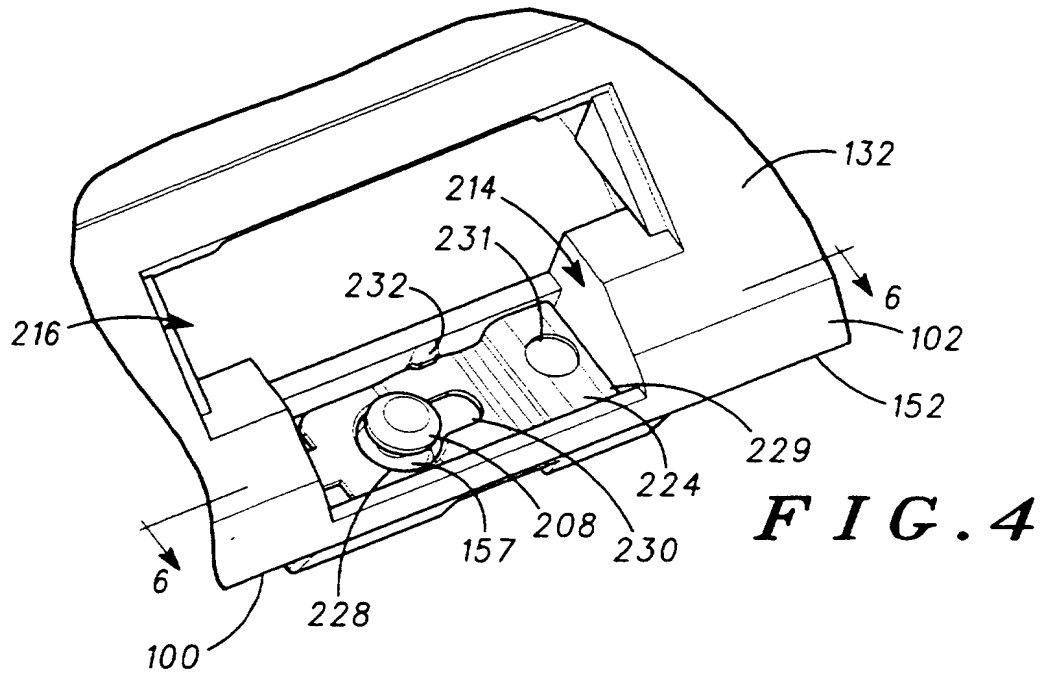


FIG. 1







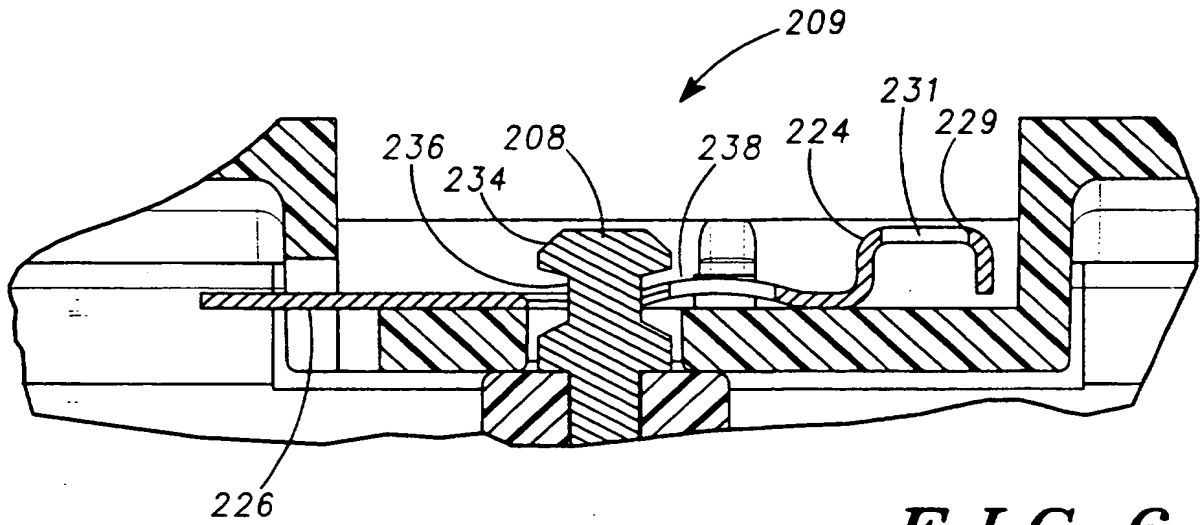


FIG. 6

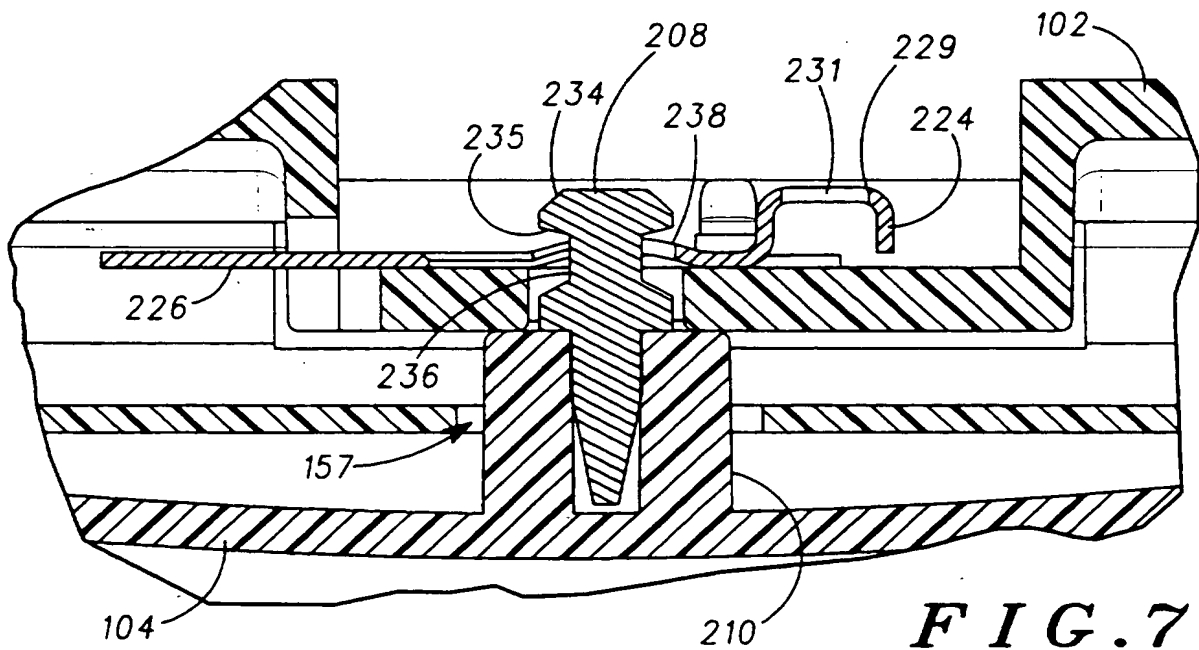


FIG. 7

5 **RADIOTELEPHONE HANDSET HAVING A REMOVABLE,
LATCHING FACEPLATE TO ACCOMMODATE A PLURALITY
OF DISTINCTIVE TELEPHONE APPEARANCES**

10 **Field of the Invention**

 The present invention generally relates to portable radiotelephones
and, more particularly, to a portable radiotelephone handset having a
removable, latching faceplate to accommodate a plurality of distinctive
15 telephone appearances.

Background of the Invention

 Portable telephones are generally well-known in the art. Portable
20 telephones includes radiotelephones, such as cellular radiotelephones,
cordless radiotelephones and personal communicators. Portable
telephones traditionally communicate with a remote base station to
provide wireless communications for a user. Portable telephones have
become a widely accepted form of wireless communications in the cordless
25 and cellular radiotelephone markets and are rapidly finding applications
in new types of communications systems such as personal
communications systems (PCS).

 Because of such wide acceptance, differentiating the appearance of
individual portable telephones has become an important requirement for
30 the customer, the manufacturer, and the distributor of the portable
telephone. Customers desire a unique appearance to satisfy their personal
tastes and preferences. Manufacturers desire a unique appearance to
provide a variety of telephone appearances to their customers, and to
provide a unique appearance for the manufacturer's own product.
35 Distributors and retailers desire a unique appearance to differentiate
themselves and their products in the marketplace and to promote their

5 name brand. The desires of manufacturers, sellers and users to have a unique-looking portable telephone are eventually communicated to the manufacturer so that the particular unique-looking portable telephone can be produced.

10 A portable telephone is conventionally produced by assembling radiotelephone circuitry, including transceiver circuitry and user interface circuitry, within a housing. The user interface circuitry includes a display, a keypad, an earpiece and a microphone. The housing traditionally includes a rear housing, having a standard molded form, mated to a front housing having a different standard molded form. The front housing is
15 adapted to provide a particular appearance by means of its molded contour, texture or color. Typically, the user interface elements are mounted inside the front housing and electrically connected to transceiver circuitry mounted in the back housing. The display and keypad may also each have a particular appearance. A particular front housing, a particular display and a particular keypad are selected by the manufacturer to give
20 the portable radiotelephone an overall particular appearance.

A disadvantage of conventionally producing the particular unique appearances of portable radiotelephones is that the unique appearance of a portable radiotelephone must be known by the manufacturer before the
25 portable telephone is manufactured. At selected locations throughout a production line, the appropriate front housing, keypad and display, etc. are appropriately assembled to produce the appropriate particular appearance for the portable telephone.

While this manufacturing technique was acceptable in the past
30 when relatively few particular appearances for portable telephones were needed, the large growth in the telecommunications industry has created a demand for a very large number of unique appearances for portable telephones. Today, a typical manufacturer may be required to track literally hundreds of portable telephone models, each having a unique
35 look. The task of managing such a demand has prompted the need for a new way to manufacture portable telephones to achieve a variety of unique appearances that meet the market demand without burdening the production flow.

Furthermore, conventionally-produced portable telephones do not
40 permit the user of the portable telephone to alter the appearance of the

5 portable telephone once manufactured or purchased. Aftermarket
companies have tried to meet the customer's need for the customer's own
unique look by providing accessories, such as cases for holding portable
telephones. However, these cases are clumsy, add weight, and have a
limited effect on the appearance of the portable telephone.

10 One known portable telephone design attempts to provide an easily
changeable faceplate. This design permits the user to alter the appearance
of the portable telephone after manufacture or purchase. The portable
telephone includes a removable, snap-fit faceplate and a housing. The
snap-fit faceplate includes a lip and tabs which fit into slots on the
15 housing. The manufacturer or user may alter the appearance of this
portable telephone by unsnapping the snap-fit faceplate from the housing
and substituting another snap-fit faceplate sized to fit the housing.

The success of such a portable phone with a snap-fit faceplate has
been limited by the inherently insecure nature of the attachment of the
20 snap-fit faceplate to the housing. The snap-fit faceplate may come loose
when the portable telephone is subjected to jarring, such as when the
portable telephone is dropped. Moreover, attempts to make the
attachment of the snap-fit faceplate more solid by making the snap-fit
connection more secure defeat the goal of an easily changeable faceplate.

25 Other known methods of attaching a faceplate to a portable
telephone housing include using one or more screws as well as more
permanent methods such as adhesive. None of these known methods has
successfully permitted the user to readily alter the appearance of the
portable telephone after manufacture or purchase.

30 Accordingly, there is a need for a portable telephone adapted to
accommodate a plurality of distinctive telephone appearances that
overcomes the disadvantage of conventionally produced portable
telephones.

5 **Brief Description of the Drawings**

 The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by making reference to the following description, taken in
10 conjunction with the accompanying drawings, in the several figures of which like reference numerals identify identical elements, and wherein:

 FIG. 1 is a first elevational view of a radiotelephone handset according to the present invention;

15 FIG. 2 is a first exploded view of a radiotelephone view of the radiotelephone handset of FIG. 1;

 FIG. 3 is a second exploded view of the radiotelephone handset of FIG. 1;

20 FIG. 4 is a first detail view of a portion of the radiotelephone handset of FIG. 1;

 FIG. 5 is a second detail view of a portion of the radiotelephone handset of FIG. 1;

 FIG. 6 is a cross-sectional view taken along line 6-6' in FIG. 4; and

 FIG. 7 is a cross-sectional view taken along line 7-7' in FIG. 5.

25

Detailed Description of the Preferred Embodiment

 Referring now to FIG. 1, it shows a front elevational view of a radiotelephone handset 100 according to the present invention. The radiotelephone handset 100 generally includes a housing 102, a faceplate
30 104 and a keypad 106 having a plurality 108 of keys. In the preferred embodiment of the present invention, the radiotelephone handset 100 is a cellular radiotelephone handset for operation within a wide-area cellular network. Alternatively, the radiotelephone handset 100 may be a cordless
35 radiotelephone handset, a personal communicator, or any other two-way communication device. The radiotelephone handset 100 is portable in that it is hand held by a user and is available for use virtually anywhere within its corresponding communication system. The handset 100 includes an antenna mount 103 adapted to receive an antenna permitting radio
40 communication within the cellular network.

5 The radiotelephone handset 100 has a user interface 110 permitting
the user to operate the radiotelephone handset 100. The user interface 110
of the radiotelephone handset 100 generally includes an earpiece interface
112, a display interface 114, a keypad interface 116 including the keypad 106,
a microphone interface 118 and an alert interface 120. The user interface
10 110 operates in a conventional manner to provide the user with wireless
communications.

 According to the present invention, the radiotelephone handset 100
is adapted to accommodate a plurality of distinctive telephone
appearances. In the preferred embodiment of the present invention, this is
15 accomplished by the faceplate 104 having a distinctive user interface
appearance. The distinctive user interface appearance is evidenced by the
distinguished appearance, or unique look, that the faceplate gives to the
earpiece interface 112, the display interface 114, the keypad interface 116,
and the microphone interface 118. In the preferred embodiment, the
20 distinctive appearance is accomplished by selecting the contour, shape,
size, texture, material and color of the faceplate. Other ways to distinguish
the appearance of the faceplate may be readily observable by those skilled
in the art of industrial design, mechanical engineering or material
engineering. Since the user of the radiotelephone handset 100 typically
25 judges the appearance of the handset 100 based on the user interface 110,
modification or replacement of the faceplate 104 provides a convenient
way to substantially alter the appearance of the radiotelephone handset 100
with minimum expense and effort.

 The housing 102 has a body appearance. In the preferred
30 embodiment of the present invention, the body appearance is a
conventionally molded housing having a standard appearance. The
standard appearance of the housing 102 is not readily changeable other
than surface appearance features such as texture and color and the like.
The rationale for this is that the mechanical design of the radiotelephone
35 handset 100 has been carefully designed in order to optimize the
radiotelephone handset 100 for space, weight, styling, etc. including
ergonomic factors such as the size and positioning of elements of the user
interface 110 and the shape and contour of the handset 100. Altering the
appearance of the housing 102 to any significant degree would require a

5 substantial effort by the designers and producers of the radiotelephone handset 100.

The housing 102 is adapted to receive the faceplate 104 as one of a plurality of faceplates to provide the distinctive user interface appearance for the radiotelephone handset 100, thereby giving the handset 100 a
10 distinctive telephone appearance. The benefit thus provided is that the handset 100 can easily change appearances simply by attaching different faceplates such as faceplate 104. Therefore, any one of a plurality of faceplates such as faceplate 104 may be readily received by the housing 102 to give the handset 100 a distinguished appearance. Further advantages
15 and features of the present invention will be described in more detail below with reference to FIGS. 2 through 7.

FIG. 2 is a first exploded view of the radiotelephone handset 100 of FIG. 1. The radiotelephone handset 100 of FIG. 2 generally illustrates the housing 102, a keypad 106 and the faceplate 104. In a typical embodiment,
20 the housing 102 contains control circuitry (not shown) providing the operational capabilities of a portable telephone such as a radiotelephone.

The housing 102 includes a plurality 124 of keypad holes, a display lens 126 and an earpiece hole 128. The plurality 124 of keypad holes form a part of the keypad interface 116 and permits electrical and mechanical
25 contact between the individual keys 108 of the keypad 106 and the control circuitry contained within the housing 102. The display lens 126 has a particular appearance and forms a part of the display interface 114 and permits viewing of and protects a display (not shown) controlled by the control circuitry within the housing 102. In the preferred embodiment, the
30 display lens 126 is affixed to the housing 102. In alternative embodiments, the display lens 126 is detachable and may be substituted with another display lens having a different particular appearance. The earpiece hole 128 forms a part of the earpiece interface 112 and permits acoustic coupling between the user's ear and a speaker contained within the housing 102.

35 The housing 102 includes a front face 130 and a rear face 132. The front face 130 preferably includes a recessed portion 134 defined by a perimeter 136. The front face 130 further includes one or more slots 138. Preferably, the one or more slots 138 include a slot 140, slot 142, slot 144, slot 146, slot 148 and slot 150. Also preferably, the one or more slots 138
40 includes other slots not visible in FIG. 2 arranged symmetrically with slots

5 140, 142, 144 and 146 on the front face 130 of the housing 102. The housing 102 has a first end 152 and a second end 154. At the first end 152, the housing 102 preferably includes a slot 156. In accordance with the present invention, the housing 102 includes an aperture 157 at the first end 152. As will be described further in conjunction with FIG. 3, the aperture 157 is adapted to receive a latch pin located on the faceplate 104 for securing the faceplate 104 to the housing 102.

The keypad 106 includes a plurality of keys 108, having a distinctive key appearance. In the preferred embodiment, the keypad 106 is securely attached to the housing 102 as part of the manufacturing process. However, in alternative embodiments, the keypad is detachable from the housing, permitting replacement with another keypad having a different distinctive key appearance.

The faceplate 104 preferably includes a plurality 158 of keyholes, a lens aperture 160 and an ear cup 162. The plurality 158 of keyholes provides tactile access to the keys 108 of the keypad 106 for the user of the radiotelephone handset 100. Each of the keyholes of the plurality 158 of keyholes is sized to accommodate one of the keys 108 of the keypad 106. Similarly, the lens aperture 160 is sized to accommodate the display lens 126 affixed to the housing 102. In this manner, the lens aperture 160 permits easy viewing of the display lens 126. The ear cup 162 includes a plurality 164 of ear holes. The ear holes permit acoustic coupling between the earpiece hole 128 of the housing 102 and the user's ear. The ear cup 162 is preferably contoured to maximize acoustic coupling.

The faceplate 104 has an outer surface 166, an inner surface 168 and a perimeter 170. Extending from the inner surface 168 along the perimeter 170, the faceplate 104 includes one or more tabs 172 including tabs 174, 176, 178, 180 and 182. Also preferably, the one or more tabs 172 includes tabs not visible in FIG. 2 arranged symmetrically with tabs 174, 176, 178 on the inner surface 168 of the faceplate 104. The faceplate 104 has a first end 184 and a second end 186. Extending from the inner surface 168 of the faceplate 104 at the first end 184 is a tongue 188. The faceplate 104 preferably includes a finger slot 190.

The faceplate 104 may be removeably attached to the housing 102 by inserting the one or more tabs 172 into corresponding slots of the one or more slots 138 in a snap-fit connection. Similarly, the tongue 188 of the

5 faceplate 104 may be inserted in the slot 156 at the first end of the housing 102. By engagement of the one or more tabs 172 extending from the faceplate 104 with the one or more slots 138 in the housing 102, the faceplate 104 is maintained snugly against the front face 130 of the housing 102. The perimeter 170 of the faceplate 104 is configured to conform to the
10 perimeter 136 of the recessed portion 134 of the front face 130 of housing 102. In this manner, the housing 102 receives the faceplate as one of a plurality of faceplates to provide a distinctive user interface appearance for the radiotelephone handset, thereby giving the radiotelephone handset
15 one distinctive telephone appearance of a plurality of distinctive telephone appearances.

Referring now to FIG. 3, it shows a second exploded view of the radiotelephone handset 100 of FIG. 1. FIG. 3 further illustrates the housing 102, the faceplate 104 and the keypad 106. In FIG. 3, the one or more tabs 172 arranged along the inner surface 168 of the faceplate 104 are visible. As
20 shown in FIG. 2, the one or more tabs 172 include tabs 174, 176, 178, 180 and 182. In FIG. 3, the one or more tabs 172 also includes tabs 202, 204 and 206.

As is further illustrated in FIG. 3, the faceplate 104 includes a latch pin 208 extending from the inner surface 168. In the preferred embodiment, the faceplate 104 includes a post 210 located on the inner
25 surface 168 at the first end 184. Preferably, the post 210 is a molded portion of the face plate 104. The post 210 includes an aperture configured to receive the latch pin 208 and securely retain the latch pin 208 by friction, adhesive or other means. Alternatively, the latch pin 208 may be
30 integrally formed with the faceplate 104, as by injection molding, or by any other appropriate method.

The housing 102 includes a battery receiving portion 212, a channel 214 and a receptacle 216. The radiotelephone handset 100 generally includes control circuitry contained within the housing 102 which operates in response to electrical power provided by a battery (not shown). The
35 housing 102 is configured to securely receive the battery attached to the rear face 132 at the battery receiving portion 212. To secure the battery to the rear face 132, the battery receiving portion 212 includes slide rails 218 and 220. The housing includes contact apertures 222 for permitting electrical contact between the battery and the control circuitry contained
40 within the housing. The receptacle 216 is configured to receive a plug (not

5 shown) which provides electrical contact to the control circuitry of the handset 100, for example, for recharging the battery or for providing operating power from an AC adapter.

The rear face 132 of the housing 102 further includes a channel 214 at the first end 152. Recessed within the channel 214 is a latch keeper 224. 10 As will be discussed further in conjunction with FIGS. 4-7, the latch keeper 224, is configured to releasably engage the latch pin 208 to securely retain the faceplate 104 as a unitary assembly with the housing 102.

Referring now FIG. 4, it shows a first detailed view of a portion of the radiotelephone handset 100 of FIG. 1. In FIG. 4, the channel 214 is 15 formed in the rear face 132 of the housing 102. Recessed within the channel 214 is the latch keeper 224. The latch keeper is preferably formed from metal or other suitably strong, rigid material.

The latch keeper 224 preferably includes a substantially flat arm 226 having a first aperture 228 and a second aperture 230 and an upright 20 portion 229 having a third aperture 231. When the housing 102 receives the faceplate 104, the latch pin 208 extends through the aperture 157 (not shown) in the front face 130 of the housing 102. The first aperture 228 of the latch keeper 224 is sized to receive a portion of the latch pin 208 when the latch pin extends through the aperture 157. The second aperture 230 is 25 contiguous with the first aperture 228 and sized to retain the portion of the latch pin 208.

FIG. 5 is a second detailed view of a portion of the radiotelephone handset 100 of FIG. 1. According to the present invention, the latch keeper is slideable between a release position illustrated in FIG. 4 and a lock 30 position illustrated in FIG. 5. In FIG. 5, the latch keeper 224 has been moved from the position illustrated in FIG. 4 in order to securely engage and retain the latch pin 208. In the release position, the first aperture 228 aligns with the aperture 157 in the housing 102 (FIG. 2) to receive the latch pin inserted through the aperture 157. In the lock position, the second 35 aperture 230 aligns with the aperture 157. The third aperture 231 is configured to receive the tip of a pen, pencil or other instrument to facilitate sliding the latch keeper 224 between the lock position and the release position.

As can be seen in FIGS. 4 and 5, the channel 214 includes one or 40 more retainers, such as retainer 232. Retainer 232 retains the latch keeper

224 in the channel 214 while permitting sliding movement between the release position for releasing the latch pin 208 (FIG. 4) and the lock position for locking the latch pin 208 (FIG. 5). The latch pin 208 and the latch keeper 224 form a latch 209. It will be understood by those skilled in the art that the latch 209 could be formed using different elements which still provide the function of securing the faceplate 104 to the housing 102.

FIG. 6 is a cross-sectional view taken along line 6-6' in FIG. 4. FIG. 7 is a cross-sectional view taken along line 7-7' in FIG. 5. In FIGS. 6 and 7, it can be seen that the latch pin 208 includes a cap 234 having a seat portion 235 and a neck 236. The neck has a neck diameter and the cap has a cap diameter. The cap diameter is larger than the neck diameter so that when the latch keeper 224 is in the latched position (FIGS. 5 and 7) the neck 236 is engaged by the second aperture 230 to retain the latch pin 208 within the latch keeper 224.

Preferably, substantially flat arm 226 of the latch keeper 224 includes an arcuate portion 238. The arcuate portion 238 is preferably slightly flexible as may be achieved if the latch keeper 224 is fabricated from a flexible material, such as thin metal. When the latch keeper 224 is moved to the lock position (FIG. 7), the arcuate portion 238 engages the seat portion 235 of the cap 234 of the latch pin 208. In this manner, the arcuate portion 238 forms a bias element for asserting a bias force between the latch pin 208 and the housing 102 when the latch keeper 224 is in the lock position. This bias force serves to snugly retain the latch pin 208 and to prevent the latch keeper 224 from inadvertently sliding from the locked position to the release position (FIG. 6).

With the latch keeper 224 in the locked position, the faceplate 104 will remain secured to the housing 102, even if the handset 100 is dropped or otherwise jarred. The latch 209 formed by the latch pin 208 and the latch keeper 224 operates to additionally retain the faceplate 104 to the housing 102, supplementing the mechanical connection provided by the one or more tabs 172 and the one or more slots 138. Unlike the apparatus provided by a tab-and-slot retainer, the latch 209 is a configurable latch in that it may be moved between a release configuration and a lock configuration. In the release configuration, the faceplate 104 may be readily removed and replaced. In the lock configuration, the faceplate 104 is secured to the housing 102.

5 Since the faceplate 104 and the keypad 106 may be attached to the housing 102 at various points in time throughout the distribution chain, it is conceived that the faceplate 104 alone or in combination with the keypad 106 may be sold as a user interface kit. Such a kit would be available to the user for a specific selection at a distribution outlet, a retail store, or by mail order, thereby allowing the user to initially use a distinctive appearance or to change the faceplate and choose another distinctive appearance at a later time.

10 From the foregoing, it can be seen that the present invention provides a radiotelephone handset adapted to accommodate a plurality of distinctive telephone appearances. The handset includes a housing adapted to receive a faceplate as one of a plurality of faceplates to provide a distinctive user interface appearance for the handset. The faceplate includes a latch pin extending from an inner surface to be engaged by a latch keeper located on the radiotelephone housing. The latch keeper allows the faceplate to be snugly retained against the housing or to be released and exchanged with another faceplate. A kit including the faceplate and a keypad for the radiotelephone handset may be separately combined and sold to provide an alternative user interface appearance for the handset.

15 While a particular embodiment of the present invention has been shown and described, modifications may be made. For example, the latch may be formed using different components, or the latch pin may extend from the housing to be engaged by the faceplate, rather than extending from the faceplate to be engaged by the housing, or the latch pin may extend from the perimeter of the housing rather than an inner surface. Moreover, the tabs and slots may be replaced with alternative means for engaging the faceplate with the housing or may be eliminated entirely. It is therefore intended in the appended claims to cover all such changes and modifications which fall within the true spirit and scope of the invention.

20 What is claimed is:

5 **Claims**

1. A radiotelephone handset comprising:
a faceplate having a distinctive user interface appearance;
a housing having a standard appearance, the housing being adapted
10 to receive the faceplate as one of a plurality of faceplates; and
a configurable latch for releaseably securing the faceplate to the
housing.

2. A radiotelephone handset as recited in claim 1 wherein the
15 configurable latch is movable between a release configuration for replacing
the faceplate and a lock configuration for securing the faceplate to the
housing.

3. A radiotelephone handset as recited in claim 2 wherein the
20 configurable latch comprises a latch pin extending from the faceplate and a
latch keeper positioned within the housing, the latch keeper engaging the
latch pin when the housing receives the faceplate.

4. A radiotelephone handset as recited in claim 3 wherein the
25 latch pin includes a neck and a cap, the neck having a neck diameter and
the cap having a cap diameter, the cap diameter being larger than the neck
diameter, and wherein the latch keeper comprises a substantially flat arm
having a first aperture sized to receive the cap when the latch pin is in the
release position and a second aperture contiguous with the first aperture
30 sized to receive the neck when the latch keeper is in the lock position.

5. A radiotelephone handset as recited in claim 4 wherein the
latch keeper further comprises a bias element for asserting a bias force
between the latch pin and the housing when the latch keeper is in the lock
35 position.

5 6. A radiotelephone handset as recited in claim 5 wherein the cap includes a seat portion surrounding the neck and wherein the flat arm comprises an arcuate portion forming the bias element, the arcuate portion surrounding the second aperture to engage the seat portion when the latch keeper is in the lock position.

10 7. A radiotelephone handset as recited in claim 2 wherein the faceplate comprises one or more tabs and the housing comprises one or more slots configured to receive the one or more tabs in a snap-fit connection.

15 8. A user interface kit for a radiotelephone handset, the radiotelephone handset being adapted to accommodate a plurality of distinctive telephone appearances, the radiotelephone handset including a housing, the housing including a latch keeper, the user interface kit comprising:

20 a faceplate having a distinctive user interface appearance and adapted to be received by the housing as one of a plurality of faceplates to provide the distinctive user interface appearance for the radiotelephone handset, thereby giving the
25 radiotelephone handset a distinctive telephone appearance, the faceplate including a latch pin adapted to releasably engage the latch keeper for securely attaching the faceplate to the housing; and

30 a keypad having a distinctive key appearance and adapted to be disposed between the housing and the faceplate.



Application No: GB 9619367.7
Claims searched: 1-8

Examiner: Melanie Jennings
Date of search: 13 November 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): H3Q (QACA, QACX); H4J (JAAB, JK)
Int Cl (Ed.6): H04B 1/03, 1/034, 1/08, 1/38; H04M 1/02, 1/03, 1/60, 1/62, 1/72
Other: Online: WPI, JAPIO, CLAIMS

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2293517 A (MOTOROLA), see whole document	1, 2, 7
A	JAPIO Abstract Accession No. 01414754 & JP 590126354A (Fujitsu) 20.07.84 (see abstract)	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.